



Department of Commerce

Safety & Buildings Division

201 West Washington Avenue

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Evaluation # 200264-A

Wisconsin Alternate Standard Evaluation

Standard

1995 National Building Code of Canada for
Unbalanced Roof Snow Load – Hip and Gable Roofs

Proponent

Wisconsin Frame Builders Association
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Iola, WI 54945-0108

SCOPE OF EVALUATION

The alternate Canadian standard, 1995 National Building Code of Canada, for unbalanced roof snow load for hip and gable roofs has been evaluated for compliance with certain structural requirements of the current **Wisconsin Commercial Building Code (WCBC), Chapters Comm 61-65**. Pursuant to s. Comm 61.61 the alternate standard and methodology as described below is approved for use in the State of Wisconsin to satisfy the intent and the unbalanced snow load design provisions of **IBC 1608.6 (ASCE 7-98, section 7.6)**

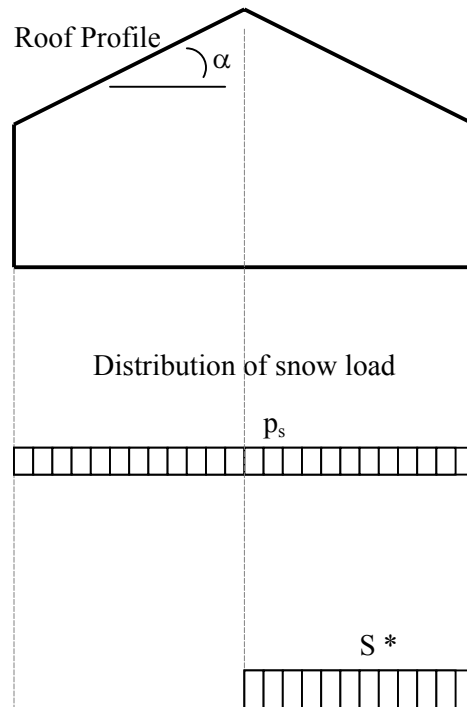
This evaluation does not include the review for compliance to provisions of the current **Wisconsin Commercial Building Code (WCBC)**, other than those specifically referenced above.

The use of this alternate standard and methodology is subject to the description, limitations and conditions described in this evaluation.

DESCRIPTION AND USE

Section IBC 1608.6 of the Wisconsin Commercial Building Code requires buildings with hip and gable roofs be designed to support unbalanced snow loads as set forth in ASCE 7-98, section 7.6.1. The distribution and magnitude of the unbalanced snow loads is dependent upon the roof length, peak-to-eave width, peak-to-eave height, wind exposure, snow density and roof slope. The alternate standard, 1995 National Building Code of Canada, and its referenced User's Guide – NBC 1995, Structural Commentaries (Part 4), has a

different methodology for determining the distribution and magnitudes of unbalanced snow loads as applied to hip and gable roofs. The methodology developed by the proponent and hereby approved by the department is as follows:



Methodology Accepted

For Balanced Loading

IBC 1608.4 (Section 7.4 ASCE 7-98)

For Unbalanced Loading

*Section 4.1.7.1 of 1995 National Building Code of Canada and referenced User's Guide – NBC 1995 Structural Commentaries (Part 4), Figure H-1, as modified below

*** Application of Canadian Standard methodology for determining unbalanced snow load**

$$S = S_s (I_s)(C_b C_w C_s C_a)$$

Where:

- S = Alternate unbalanced roof snow load
- S_s = Ground snow load from IBC Figure 1608.2 or Com Figure 62.16-1
- I_s = Importance Factor from IBC Table 1604.5
- C_b = Basic roof snow load factor of 0.8
- C_w = Wind exposure factor of 1.0
- C_s = Slope factor (See Tables S-1 and S-2)
- C_a = Accumulation factor (See Table A-1)

TABLE S-1 Non-slippery roof (i.e. shingles)	
Roof Slope,	Factor, C_s
$\alpha \leq 30^\circ$	1.0
$30^\circ < \alpha \leq 70^\circ$	$(70^\circ - \alpha) / 40^\circ$
$70^\circ < \alpha$	0

TABLE S-2 Unobstructed Slippery roof where snow and ice can slide completely off (i.e. steel)	
Roof Slope, α	Factor, C_s
$\alpha \leq 15^\circ$	1.0
$15^\circ < \alpha \leq 60^\circ$	$(60^\circ - \alpha) / 45^\circ$
$60^\circ < \alpha$	0

TABLE A-1	
Roof Slope, α	Factor, C_a
$\alpha \leq 15^\circ$	N/A. Analysis for balanced loading only.
$15^\circ < \alpha \leq 20^\circ$	$0.25 + \alpha/20$
$20^\circ \leq \alpha \leq 90^\circ$	1.25

LIMITATIONS/CONDITIONS

When this alternate standard and methodology is utilized, building plans and calculations showing the load distribution shall be submitted for review in accordance with ss. Comm 61.30 and 61.31.

The Wisconsin Building Alternate Standard Evaluation number is to accompany each plan submittal for projects that utilize this alternate standard and methodology.

Deviations from how this alternate standard and methodology is applied to gable and hip roof buildings shall void the use of this alternate standard approval.

Pursuant to s. Comm 61.61(7), the department may reexamine an approval and issue a revised approval at any time.

This approval will be valid through February 3, 2008, unless modifications are made to the alternate standard and methodology or a re-examination is deemed necessary by the department.

DISCLAIMER

This approval addresses only the specified applications for the alternate standard and does not waive any code requirement not specified in this document.

Approval Date: February 3, 2003. By: _____
Laurence J. Swaziek, PE
Program Manager
Safety and Buildings Division

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